

Division XXI CSS: Value Added

or

Just a Repeat of History ?

A Monograph

By

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ABSTRACT

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By Major Michael J. Curry, USA, 41 pages.

Under the Army's Force XXI campaign, the Army has redesigned the heavy division for the 21st century, aptly naming it Division XXI. In designing Division XXI, the Army made a key decision to radically alter the way logistics will be conducted at the tactical level. Given personnel end strength constraints to future force development, Division XXI was designed to be smaller than the current Army of Excellence heavy division. In support of the new divisional design, the Army has attempted to reduce its proverbial "tail" in order to lessen the logistic footprint. Army planners therefore embarked on a new intellectual, organizational, and technological approach to tactical logistics at the division level.

This monograph examines the question of whether the organizational and technological changes to the AOE Forward Support Battalion (FSB), sustain the flexibility and tactical mobility of the armored and mechanized infantry task force. This monograph briefly examines the driving forces behind Division XXI, and then explores the development of the Army of Excellence CSS structure. The author then provides a synopsis of current doctrinal roles and missions of the heavy division CSS organizations, with an emphasis on the FSB; and follows this up with an in depth review of Division XXI CSS and the new FSB. The author uses the Army's Joint Venture Analytic results to underscore the Army's failure to properly test and analyze Division XXI CSS and identifies some of the major challenges the new organization structure has in sustaining the flexibility and tactical mobility of the armored and mechanized infantry task force. The author thus concludes that the new Division XXI FSB does not sustain the flexibility and tactical mobility of the armored and mechanized infantry task force.

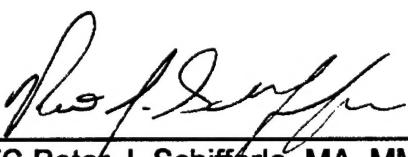
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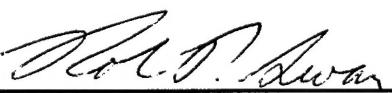
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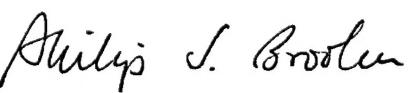
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INTRODUCTION

"It takes little skill or imagination to see where you would like your Army to be and when; it takes much knowledge and hard work to know where you can place your forces and whether you can maintain them there."¹

The Army's new heavy division for the early part of the 21st century is one of the latest victims of military force downsizing. In building the heavy division for Force XXI, the Army made a key decision to radically alter the way tactical logistics will be performed on the future battlefield. In an effort to reduce the logistics tail to support end strength constraints, and to lessen the logistics footprint in future theaters of operation, the Army is revamping organizational structures and attempting to leverage the effects of new and emerging technologies. As a result, the Army has embarked on a new intellectual, organizational, and technological approach to tactical logistics. What warrants investigation are the Army's assumptions that by revamping logistics organizations, and integrating new and emerging digitized technologies it can reduce the logistics footprint, and simultaneously improve the sustainment of armored and mechanized infantry brigade task forces. This is not the first time the Army has looked towards new organizational structures and technology as a way of changing itself in response to downsizing pressures, and increased need for organizational efficiencies.

The Army of Excellence (AOE) study carried out during the mid 1970's to early 1980's confronted pressures, which called for a reduction in the size of the Army; thus, a reshaping of the heavy

divisions. As is often the case, the Army looked back towards cutting its proverbial "tail" to make ends meet. Army planners made conscious decisions to reorganize divisional CSS force structure, and seek out manpower-reducing technologies to facilitate meeting end strength constraints without reducing the flexibility and tactical mobility of the heavy brigade task forces. Unfortunately, the Army plan did not work as envisioned organizations were slow to change, manpower was reduced to size the force, and technologies were slow to come, or did not function as conceptualized. Division XXI studies, tests, and experiments provide indications that the Army may be heading down a similar path with Division XXI. CSS in support of Division XXI is markedly different from its AOE predecessor. There is less organic logistical force structure, and the division is heavily dependent upon the successful integration of technologies. The new division is also designed to operate on a larger more dispersed battlefield; and is more reliant upon echelon-above-division EAD logistics support. One of the most noticeable CSS changes in the new division is the organizational reconfiguration of brigade level logistic support organizations.

What is important to note for the reader is that the Army's new division is not an end state in itself, but merely a pathway to the future and the Army After Next (AAN). Conceptually, the Army knows where it wants to be tomorrow, but the question still looms if it can sustain itself once it gets there. The antithetical relationship between "tooth and tail", evident throughout Army history, is evident again today in the Army's quest for change at the dawn of the next

century. The purpose of this monograph is to explore one fundamental question: will the organizational changes and technological changes to the AOE FSB, sustain the flexibility and tactical mobility of the armored and mechanized infantry brigade task force?

This question of mobility and flexibility is important, because "increasing flexibility and tactical mobility have been dominant objectives of force design planners."² The primary emphasis of division planners for years has been the issue of flexibility and tactical mobility. Force design trends show a structure attempting to use mobility, flexibility, and firepower to expand the size of the battle space and tempo of operations.³ This trend is still holding true, with Division XXI designed to dominate a battle space of 120x220 kilometer vice 100x100 kilometers under AOE.⁴ Flexibility and tactical mobility for the purpose of this monograph will be defined as follows: flexibility is the ability of the maneuver brigade to adjust plans to changing situations on the conventional battlefield, and tactical mobility is the ability to move combat power over space and time.

Chapter one begins with a review of the driving forces behind Division XXI, and the salient aspects that give it meaning. The chapter concludes with a historical review of lessons learned in past divisional organizational design changes, focusing on key dilemmas of planners who redesigned logistic forces during the AOE study. Chapter two then looks at current CSS doctrine, and discusses the roles and missions assigned to current AOE divisional logistic organizations; specifically the (FSB). Chapter three explores the conceptual framework of Division XXI logistics and the new roles and missions for

logistics organizations organic to Division XXI. Furthermore, chapter three places an emphasis on changes to the FSB, and examines the Army's Joint Venture process for Force XXI, focusing on the studies, tests, and experiments used to build CSS for Division XXI. The Joint Venture analytic results are used to facilitate determining if the Division XXI FSB sustains the flexibility and tactical mobility of the armored and mechanized infantry brigade task force. Chapter four concludes the monograph with an assessment of the new FSB redesign.

CHAPTER I

The Unveiling of Division XXI

"We accept the Army's argument that with the requirement they are facing today, they cannot and should not cut force structure or cut capability. But I asked them to look carefully at whether the introduction of new technology and new organizational approaches could allow them to reduce personnel while maintaining force structure and maintaining or increasing capability."⁵

The political pressure to draw down the size of force and to look hard at technology and new force design as a key to overcoming reductions in the force, is clearly evident in the above remarks from former Secretary of Defense William Perry. These remarks, contained in a January 1997, article in Government Review, reviews a November 1996 announcement by Secretary of Defense Perry. Interesting to note, in that same year, the U.S. Senate approved the Military Force Structure Review Act, which lead to the formation of the Quadrennial Defense Review (QDR), and an independent, nonpartisan National Defense Panel (NDP). These two forums assessed the military in view of two

fundamental questions. "First, in light of geopolitical changes and the potential of technologies, what new challenges, threats, and opportunities will our armed forces face? And second, how should we organize, equip, and size our forces to deal with the broad range of threats and opportunities they may encounter in the twenty-first century?"⁶ The NDP at the time gave a strong recommendation to the Army to change its force structure, targeting the Army division, and citing progress under the Force XXI campaign as reason for change. The panel's recommendation suggested an evolution to smaller operational elements with similar or better lethality, expeditionary qualities, and fast shock producing ability.⁷ In June of 1998, after many years of analysis, the Army unveiled its new division for the 21st Century - aptly naming it Division XXI.

Division XXI is smaller than its AOE predecessor and fully embraces new and emerging digitized technologies. The personnel end strength is currently at 15,302 active duty soldiers, and 417 reserve component soldiers assigned in times of deployment. This sharp decrease results in a net loss of 2700 active duty soldiers when compared to the 18000 plus soldiers authorized in today's AOE heavy division. The composition of Division XXI consists of one armored and two mechanized infantry brigades, division artillery, aviation brigade, division troops, and the division support command. The armored brigade has two armored battalions and one mechanized battalion; and the mechanized infantry brigade has two mechanized battalions and one armored battalion. Although smaller than its AOE predecessor, the core capabilities of the AOE division are still

present. The significant changes in Division XXI can be witnessed when peering at organizations battalion level and below.

The most noticeable change is each armored and mechanized infantry maneuver battalion is authorized only three maneuver companies, instead of the four currently authorized under AOE. However, the most striking difference is the elimination of organic logistical assets assigned to armored and mechanized infantry brigades and battalions, and the exponential increase in size of the FSB. However, a holistic view of the organization shows less logistical spaces in Division XXI when compared to the AOE. Evidence will point out that the Division XXI DISCOM has grown larger; yet, the overall logistic footprint of the division has been reduced.⁸ In an era of downsizing, changes to force structure and reductions of logistics footprint to achieve greater organizational efficiencies is a common Army experience.

Tooth-to-Tail and the AOE

Reducing logistics footprints is not new for the Army; cutting "tail" has traditionally been the situation when forced to cut manpower; and trying to preserve the combat punch of the division. In the early 1980's, when working the development of the AOE, planners needed to cut end-strength, and find a way to get to eighteen active divisions. The answer was, cut the "tail" to save the "teeth." CS/CSS was cut to support end-strength constraints, and AOE planners shaved combat support and combat service support to make a 780,000 end-strength figure fit with the 18 active division plan of the time.⁹

The only means of creating an eighteen active division force was by "drastic" cutbacks in combat support and combat service support.¹⁰ The Army's concept of reducing robustness and redundancy, formulated as R² led to the area support concept and multi-capable soldier concept.¹¹ The armored DISCOM was reduced from an end-strength of 3581 to 2810, for a net loss of 771 spaces. In an attempt to make this work, all direct support maintenance with the exception of military intelligence and signal was consolidated under the DISCOM. "Major savings came from the elimination of supply and transport, medical, and maintenance battalions, and placing some of those assets in a main support battalion (MSB)."¹² Manpower savings were also attempted by introducing new technology into the force.

The Army during AOE development went through a mental and physical transformation in terms of manpower, doctrine, materiel, and organization.¹³ One of the overarching design objectives in heavy division logistics was to replace soldiers with better technological equipment, in an effort to minimize the tooth-to-tail ratio.¹⁴ In the supply arena for example, less manpower was available for managing, storing, and distributing fuel and food, and in maintenance there was an increased reliance on corps for repair parts.¹⁵ In spite of the perceived benefits of improved technologies and organizations to ameliorate the reduction of manpower, much of it did not bear fruit. Interestingly, in the 1980's, the Army used a term called "AOE risk," to describe the risks associated with the decrease in CSS manpower in expectation of gains in both efficiency and effectiveness from productivity enhancing initiatives.¹⁶

The Logistics Center at Fort Lee initiated the Logistics Unit Productivity Systems (LUPS) program, which was a management program chartered to reduce CSS space authorizations while "simultaneously" trying to improve CSS unit productivity. The key to the program's success was attempting labor saving initiatives, such as: automated pipeline, robotic fueling, and expert diagnostic systems.¹⁷ However, evidence cited in a Government Accounting Office (GAO) report, later criticized the LUPS program for failing to achieve the manpower savings through labor saving initiatives. The GAO attributed the failure to mismanagement of the program.¹⁸ History appears to be repeating itself, for "it is possible that the Army may this time be introducing a "FXXI CSS risk" by again front loading decreases in manpower in anticipation of future increases in efficiencies and effectiveness attributable to FXXI CSS (technologies)."¹⁹

In summary, in June of 1998 the Army unveiled Division XXI, a smaller version of the AOE heavy division by nearly 2700 active duty soldiers. The core capabilities of the AOE heavy division still remain inherent in Division XXI, although, significant changes took place in CSS relative to support of armored and mechanized infantry brigades. The most striking change is the elimination of logistical assets organic to the brigade, the enlargement of the FSB, and the anticipated integration of new and emerging technologies. Cutting "tail" to preserve the "teeth" is not new. In the 1980's, during the AOE study, the Army introduced a term called "AOE risk," a term which signified the risks associated with the decreases in CSS manpower in exception of gains in efficiencies and effectiveness. Again, in 1998,

history may reassert itself, for the Army may very well be introducing a "Force XXI CSS risk," by attempting to "front-load" cuts in manpower in anticipation of technology mitigating the "front-load" losses, and simultaneously improving CSS unit efficiency and effectiveness. This next chapter will first examine the doctrinal nature of CSS operations in support of current AOE heavy divisions, and then lead into a discussion on the divisional CSS organizations, with a particular emphasis on the FSB in support of the armored and mechanized infantry brigade.

CHAPTER II

CSS Operations in Support of the AOE Heavy Division

"It is the AOE that is being reexamined today-for the same reasons that earlier divisions have been restructured-to better accomplish the mission, take advantage of technology and to satisfy national military strategy."²⁰

Since it is the AOE that has been reorganized to form Division XXI, a closer look at CSS operations in support of AOE heavy divisions is sufficiently warranted. With an understanding of AOE heavy division CSS, the reader will be better able to distinguish between current heavy division CSS operations and future Division XXI CSS operations. Therefore, this chapter will examine the function of AOE brigade missions, the tactical logistic functions prescribed in the current FM 100-5, *Operations*, the doctrinal characteristics of CSS in support of FM 100-5, and the make up of heavy division logistic organizations, with an emphasis on the FSB.

Under AOE, armored and mechanized infantry brigades have the stated mission of applying maneuver and shock effect to destroy the enemy. Success is dependent upon the application of combat power at the right place and time, a direct function of a brigade's flexibility and mobility. CSS units and assets in support of brigade operations, concentrate their efforts on executing tactical logistics prior to, during, and after operations. The doctrinal framework which shapes the planning, preparation, and execution of tactical logistics is centered on six functions: manning, arming, fueling, fixing, moving, and sustaining the soldier and associated weapon systems.²¹

In addition to the six tactical logistics functions, CSS in support of combat is guided by a set of doctrinal characteristics outlined in the current FM 100-10, *Combat Service Support*. These characteristics when incorporated into CSS operations provide maneuver forces the requisite flexibility and mobility to change plans rapidly and to bring combat power to bear at the right place and time. These characteristics are as follows: anticipation, integration, continuity, responsiveness, and improvisation. Anticipation is to see the future and make available the resources to the users; integration is synchronizing operation and logistic plans; responsiveness is flexing to meet new and immediate requirements; and improvisation is seeking creative ways to get things done.²² These characteristics provide an overarching basis for tactical logistic units to plan, prepare, and execute CSS.

The tactical logistic functions as prescribed above are carried out by elements organic to combat and combat support units, the

division's FSB's, main support battalion (MSB), and aviation support battalion (ASB). The FSB's, MSB, and ASB are organic to the Division Support Command (DISCOM). Each armored and mechanized brigade in the division has a habitually supporting FSB providing DS. The MSB operates in the division support area and to the rear of the division boundary, and maintains the division reserve of critical supply classes: I (rations), II (general supplies), III (fuel), IV (barrier materiel), and VII (major end items). The maintenance company in the MSB supports the FSBs beyond their capability, and also maintains the division's main stockage of repair parts. In terms of transportation, the MSB has the only transportation unit in the division, and therefore plays a key role in the distribution of soldiers and materiel in the division. In the MSB the medical capability is slightly greater than FSBs. The medical unit in the MSB has optometry, mental health, and preventive medicine capabilities. As we move forward in our discussion on the AOE and CSS organizations, it is important to understand the roles and missions of the logistical assets organic to armored and mechanized infantry brigades.

The logistical assets organic to the maneuver units are grouped with other supporting CSS assets to form trains: unit, combat, and field. These trains are configured according to mission, enemy, troops, terrain, and time available. During assembly area operations and tactical marches these groupings normally form unit trains. These logistical assets provide each brigade and its subordinate battalion and company elements a degree of flexibility and tactical mobility on the battlefield. Since they are under the direct command and control

of the brigade, battalion, and company level commander, they can be used to support operations, as the maneuver commander deems appropriate. Army tactics, techniques, and procedures (TTP) have long sought to free the maneuver commander from the burden of focusing on logistics. *FM 71-2, Tank and Mechanized Infantry Battalion Task Force* manual states, "the burden of CSS is removed from the maneuver company commander, as much as possible, and placed under control of the task force. The company team commander concentrates on fighting his unit to accomplish the tactical mission." Although the company team is the lowest level in the battalion to conduct a logistics function, its major responsibility is to send logistics reports and requirements up the chain of command, and execute logistic missions once inside its own AO.²³ Company train elements usually consist of a medical evacuation team, and maintenance team positioned about 500-1000 meters behind the most forward company to provide immediate medical aid and maintenance recovery. However, the bulk of organic brigade CSS is in the armored and mechanized infantry battalion trains.

The majority of logistic assets organic to AOE maneuver battalions are pooled in the battalion combat trains. These trains are comprised of the: company train command posts (CP), supply CL III (fuel)/CL V (ammunition) vehicles, medical platoon elements, decontamination assets, communications elements, and the unit maintenance collection point (UMCP), along with supporting slice logistic assets from the FSB. These trains are located approximately 4-8 kilometers behind company team logistic elements, and are tailored to provide flexibility to the battalion commanders. The last echelon

of trains is the field trains. They are a consolidation of organic logistic resources not immediately required by the combat units. Field trains are collocated with the FSB in the brigade support area (BSA), and are employed at ranges from 20-40 kilometers from the lead company. These trains are comprised of the personnel administration center (PAC); field feeding section; company supply; and remaining maintenance elements not positioned forward.²⁴ Together these trains provide flexibility and tactical mobility to the maneuver brigade. This next part discusses FSB operations in support of the heavy brigade. The AOE FSB is the central nodal point for logistics in the division's armored and mechanized infantry brigade areas of operation (AO).

The AOE Forward Support Battalion

AOE armored and mechanized brigade has a habitually supporting multi-functional FSB in direct support. The FSB's primary role according to FM 63-20, *Forward Support Battalion*, is to provide direct support to the brigade, division units in the brigade's AO, and non-divisional units when augmented from higher level organizations. Four major elements make up the FSB: headquarters and headquarters detachment (HHD), supply company, maintenance company, and medical company.

The (HHD) is the command and control hub for unit administration and all internal and external support operations. The supply company receives, stores, and issues supply classes I (rations), II (clothing/equipment), III (fuel) and (lubricants), class VII (major

end-items), limited class IV (barrier/construction materiel), and transloads class V (ammunition). This organization also operates a salvage point and provides organizational maintenance for its own vehicles. The maintenance company fixes weapon systems and provides a common repair parts service from its base maintenance area and maintenance support teams (MST) in the maneuver trains area. The maintenance organizational structure is not fixed and is contingent upon the task organization of the supported force, and performs an array of maintenance related functions: DS maintenance to supported units, limited recovery support, technical assistance, and maintenance of an authorized stockage of repair parts. The medical company helps man the force by returning sick and wounded soldiers to duty. This unit performs a myriad of important functions: medical treatment and or initial care to support further evacuation, ground evacuation from maneuver trains and casualty collection point areas, dental care, medical resupply, laboratory and radiology services, and a 40 patient hold facility. The organizational structure is based on a modular support system to allow for tailoring, augmentation, or reinforcement.²⁵ The command and control node and disposition of FSB CSS units in the brigade AO, coupled with the available materiel and services provided by each of the functional companies, provides the brigade commander with a degree flexibility and tactical mobility.

In summary, the evidence shows the essential functions performed by the organic trains elements, and the FSB in support of the armored and mechanized infantry brigades. These organic logistic elements plan, prepare, and execute the tactical logistic functions of:

manning, arming, fueling, fixing, moving, and sustaining soldiers and their weapons systems. When the doctrinal CSS characteristics of: anticipation, integration, continuity, responsiveness, and improvisation are incorporated into the framework of brigade level CSS operations, they support sustaining the flexibility and tactical mobility of the maneuver force. However, future brigade level CSS operations are markedly different from those conducted today. The next chapter, chapter three underscores some of the major differences.

CHAPTER III

The Army in the 21ST Century and Division XXI

Force XXI and the characteristics that define the concept, quickly allows one to fathom the direction the Army is going in terms of force structure. The five characteristics of Force XXI future operations are: doctrinal flexibility, strategic mobility, tailorability and modularity, joint and multinational connectivity, and versatility. Flexible doctrine allows application of forces in varied scenarios. Strategic mobility supports rapidly getting the right force to the right place, in time. Tailorable and modular forces, organized in a more flat versus hierarchical manner enhances rapid deployability.²⁶ These five characteristics along with the vision of the future battlefield are changing the way divisions will conduct future combat operations. As will be later shown, these changes are profoundly influencing the flexibility and tactical mobility of the armored and mechanized infantry brigade. The Army's

intellectual, organizational, and technological approach to tactical logistics is radicalizing CSS operations on the future battlefield.

Major features of the Force XXI battlefield, which impact on CSS and the sustainment of flexibility and tactical mobility of the armored and mechanized infantry brigade include: the extended battle space, dispersed application of forces, non-linear formations and operations, and rapid operating tempo. The most likely combat action are those where attacks are conducted simultaneously throughout the depth, breadth, and width of the battle space to shock and destroy the enemy. The main combat menu for commanders will be raids coupled with deep strikes. As a result of the latter, the Army has postulated that these types of military operations demand a change in how we think about sustainment, development of organizational structures, and leverage technologies.

The Army has determined that in order to achieve success in the aforementioned operating environment, five imperatives must be assimilated into the organization. These imperatives are: rapidly tailored units, organizations built around information handling, flexible mission dependent leader to led ratio, tailorable divisional forces for specific type missions, and modular combat support and combat service support organizational structure.²⁷ The Army's Joint Venture process has been the thinking mechanism steering the Army into the next century.

The Joint Venture (JV) process is at the heart of Division XXI. There are four main elements which make up the JV analytic process: Division Advanced Warfighting Analysis (DAWE), Division Design

Analysis (DDA), TF XXI Army Warfighting Experiment (AWE) analysis, and a CSS evaluation. DAWE focused on battlefield command and control of Division XXI organizations. DDA was a comparative analysis using constructive simulation to focus on the design, combat service support, and performance of the division. The TF XXI AWE focused mainly on the effects of digitization through constructive and experimental analysis. The last element in the process was the CSS Evaluation, using mainly a constructive examination approach to focus on the viability of the CSS concept.²⁸ The underpinning of Division XXI is centered on fully digitizing the force by leveraging new and emerging technologies.

Division XXI is attempting to harness technologies to improve the synergy of combat power available to the commander: maneuver, firepower, protection, and leadership.²⁹ The new command and control systems for Division XXI are designed to create and provide a shared relevant common picture (RCP) of the battlespace. The RCP shared across the force conceptually provides commanders with three central pieces of real time data: present unit location, higher, lower, and adjacent unit locations, and the enemies location.³⁰ However, the effects gained by digitization, need to be part of the organic capabilities of the Division XXI CSS force. Although, evidence will later show that because of funding and other technical matters, Division XXI's CSS force during many of the tests and experiments could not validate or confirm the effects of digitization on unit performance. This next part examines the Army's vision for the conduct of future military operations. As change unfolds in the

concept of operations, so too are changes in the concept of CSS. The patterns of operation described below provide the reader with insight into how the Army envisions itself conducting operations in the next century.

CSS and the Six New Patterns of Operations

The six new patterns of Force XXI operations are: projecting the force, protecting the force, gaining information superiority, shaping the battle space, decisive operations, and sustaining/transitioning the force.³¹ The Army's conceptual definitions for these patterns are as follows: Project the force in terms of division operations is the Army's ability to deploy two heavy divisions in thirty days, and 5.3 divisions in seventy-five days; simultaneously projecting the capability to sustain the projected combat power. Protecting the force is achieved through leveraging the effects of full situational awareness across the operating spectrum, focusing on preventing detection, preventing acquisition, averting strikes through drills, and enhancing survival via ballistic protection and telemedicine. Gaining information dominance is achieved by dominating information operations, and beating the enemy in terms of information, and influencing battles with the enemy essentially paralyzed.

Shaping the battle space is accomplished through setting the conditions for success by impeding on the enemy and posturing forces to take advantage of the operational environment. The objective is to coherently degrade the enemy's ability to fight before conducting decisive operations, which leads to simultaneous engagement of the

enemy. While sustaining and transitioning the force focuses on increasing the speed of logistics to match the speed of maneuver operations. To sustain the flexibility and tactical mobility of future combat operations, CSS planners focused on improving logistic decision making by leveraging new digitized technologies, providing increased situational awareness, and asset visibility.³² The Army's belief was and remains that these new divisional patterns require a new way of thinking about logistic support.

TRADOC philosophy was to break free of the past and develop a new paradigm for the current intellectual, organizational, and technological approach to logistics. In one of its key pamphlets for force development it states, "logistic paradigms developed to support the general conflict mold of the Cold War are now inadequate and have caused the development of a number of improvements. But the Army's historical mind-set of echelon support and structured tooth-to-tail ratio has little place in this new strategic environment"³³ This paradigmatic shift, lead to a changed view in the conduct of future logistic operations. Future logistics will take effect on a larger more extended battle space, with extended lines of communications (LOCs), forced entry operations without host nation support resources to offset logistic shortfalls, and bare-based areas of operations.³⁴ These operating environments will tax the logistics system's ability to get materiel from the industrial base to the foxhole. Rapid tempo, non-linear operations, increased dispersion of forces, and extended LOCs will require a more robust organic logistic system. Evidence will later show how future operating environments impact on Division

XXI logistics support; thus, limiting the flexibility and tactical mobility of the armored and mechanized infantry brigade. The new paradigm for logistics attempts to move away from traditional just-in-case supply, where materiel is stockpiled, to just-in-time supply, where materiel is distributed when required.

The Army's paradigm in logistics, from just-in-case to just-in-time, places a premium reliance on technology, and the abilities of leaders and soldiers. The Army claims Division XXI logistics is also heavily dependent upon guaranteed communications and information management systems to support future logistic operations.³⁵ Equally as important, is the dependency on the abilities of CSS leaders and soldiers to assimilate mass amounts of information, and to quickly and decisively act on that information. Colonel Douglas A. McGregor in his book *Breaking the Phalanx*, underscores the requisite increased reliance on subordinate officers', soldier's judgment, intellect, and character. This reliance is dictated by an environment of more dispersed and decentralized operations³⁶

The new model for logistics has resulted in a major transformation of logistic organizations in Division XXI. CSS planners leaned toward modular type organizations, capable of operating via split-based, and with lessened logistic footprint in theater. Again, as in the development of the AOE, the Army looked towards its proverbial "tail" to try and achieve increased efficiencies, forming new logistic organization structures and pushing integration of new technology into the force. Even though technological integration of functioning systems is central to the

success of Division XXI logistics, the proper redesign of CSS organizations to match the imperatives of flexibility and tactical mobility are equally critical. However, CSS planners in their efforts to achieve flexibility and tactical mobility with less of a logistic footprint are conceptualizing the use of split-based operations along with modular organizations in an increasing role.³⁷

Tooth-to-Tail in Division XXI

"The [tooth-to-tail] contest. [The] contest, which, from the dawn of military history, has been waged between those strategists and operational commanders who desire mainly to put all their assets into fighting, "teeth" arms and the administrators and quartermasters (whose warnings that do so courted logistic disaster) who so often have seen the logistic "tail" services cut to the bone.³⁸

Throughout the Division XXI CSS study, TRADOC's plan was programmed to leverage technology to support reductions in the number of CSS soldiers required to perform specific functions. The objective for force designers and planners was to reduce manpower by increasing the use of automation in areas that deal with rations, fuel, and other sustainment functions.³⁹ In *TRADOC PAM 525-200-6, Combat Service Support*, the roadmap for Force XXI doctrine, training, logistics, organizations, materiel, and soldiers (DTLOMS), it specifies that tactical logistics requires less soldiers because improved asset visibility and more timely and accurate reporting across the battle space will minimize the need for supervisory redundancy. The pamphlet goes on to outline how new digital capabilities are to "minimize human intervention", yet, still allow for right place, right time, right

materiel, type of support to take place on the battlefield.⁴⁰ When looking at the AOE heavy division and Division XXI logistics organization, one can see the Army's emphasis on shaving the "tail," in anticipation of better sustaining flexibility, tactical mobility, and firepower of the combat force.

In the AOE heavy division there are 5169 spaces for CSS soldiers. Division XXI's division support command's strength is 4329, plus 272 in the remainder of division. This leaves a total logistic space allocation of approximately 4601 spaces, and a net savings of 568 spaces in combat service support, or an almost 10 percent reduction from AOE.⁴¹ Over just the past two designs, the AOE heavy division and Division XXI, CSS has took some deep cutbacks in manpower spaces. The problem however with these space saving/cutting measures is the relatively slow integration of new technologies that are programmed to offset the reduction in manpower. Programmed structures designed to sustain the flexibility and tactical mobility of the maneuver force are never realized, and any efficiencies expected only result in greater inefficiencies. As stated earlier, the LUPS program failed to achieve intended outcomes for the AOE.⁴² Matter of fact, LTG William "Gus" Pagonis, in his book Moving Mountains, writes about how logisticians were limited because they did not have certain "things" during Operation Desert Storm (ODS). Much of these shortfalls he attributed to "tight budgets and tough choices [as] the order of the day for many years."⁴³ The "tough choice" LTG Pagonis is referring to are between "tooth" and "tail." Historical evidence thus far has clearly shown the "tooth" always comes before the "tail." This next

part takes a closer look at the Division XXI CSS structure, highlighting the designs new features; thus, providing the reader with definitive insights into the changes made in CSS, specifically those relative to the FSB.

Division XXI CSS Organizational Structure

The Division XXI support command's responsibilities remain virtually unchanged when compared to its AOE predecessor. The DISCOM is still responsible for coordinating and synchronizing all support requirements and activities in support of the division. The major difference is the coordination and synchronization of logistics conceptually that takes place over a complex network of digitized technologies and information-management systems. Through the use of new and enhanced technologies such as; Force XXI Battle Command Brigade and Below, (FBCB2), Combat Service Support Control System (CSSCS), and existing Standard Army Management Information Systems (STAMIS) technologies the commander and his/her staff are designed to have full situational awareness. This conceptually enables them to make timely decisions to better support and influence the battle. This network of information management systems and digitized technologies are conceptually permeated throughout the DISCOM's subordinate organizations.

The DISCOM organization consists of a: headquarters and headquarters company, aviation support battalion, a divisional support battalion vice main support battalion, and one forward support battalion for each armored and mechanized infantry brigade.⁴⁴ The key

organizational design change to the DISCOM headquarters is the Distribution Management Center (DMC), vice Materiel Management Center (MMC) in the AOE division. The DMC serves as the nerve center for the division's logistical data. The data is captured through information-based digitized technologies linked across the force. The AOE MSB has been replaced by what is now called the division support battalion (DSB). The DSB does not fulfill the mission of back up/reinforcing support to the FSBs, as did the MSB under AOE. The exception to the latter is CL III (bulk) reinforcing and resupply.⁴⁵ Under AOE, the FSB's were dependent upon the MSB for across the board supply replenishment and augmentation of various services. The new FSB's, under Division XXI, are basically responsible for sustaining the armored and mechanized infantry brigades in isolation of the DSB.

Division XXI Forward Support Battalion

Central to this monograph is the FSB in support of the maneuver brigade. The most radical design feature of the FSB is the creation of forward support companies (FSC). Each armor and mechanized infantry battalion will have an FSC in support of its operations. The FSC is under the control of the FSB, is multi-functional by design, and is tailored to provide both organizational and direct support to an armored or mechanized infantry battalion task force. The other central feature of the FSB is the base-support company (BSC). The mission of the BSC is to provide DS supply and maintenance support to the artillery battalion, organizational and DS to the engineer battalion, brigade HHC, and the newly added brigade reconnaissance

troop. The BSC also provides limited reinforcing/back-up support to the FSCs. The forward support medical company (FSMC) remains basically unchanged from its AOE predecessor. The FSMC provides both levels I/II health care service. These medical services include medical supplies, treatment teams, and evacuation support in the BSA.⁴⁶ Coupled with these design changes, the organizational roles and missions of FSB subordinate organizations have changed as well.

The roles and missions for the organizations assigned to the FSB are as follows. The headquarters and headquarters company (HHC) is the administrative and command and control node for all organic and attached elements of the FSB. The staff organization compared to its predecessor remains relatively unchanged, except for the addition of a unit ministry team, and increased support operations section. The support operations staff section is central to the success of logistic operations, serving as the central point for logistic coordination and distribution of support. The most radical change, the FSC, is conceptualized to be as mobile as the force it supports⁴⁷

The FSC headquarters is the command and control node for all FSC elements in support of a maneuver battalion. There is a support operations section within each FSC headquarters, which serves as link between the maneuver battalion and FSB support operations section. The FSC supply and transportation (S&T) platoon provides all classes of supply, with the exception of medical supplies. Within the S&T platoon is a distribution section, which provides resupply of CL III (bulk) and CL V. The FSC is also composed of a maintenance platoon, which has the mission of providing organization and DS maintenance,

class IX (repair parts), and equipment recovery. The capabilities of the maintenance platoon are inherent in the combat repair teams (CRT), and each maintenance platoon has three CRTs, one for each maneuver company. CRTs pass back all non-fixable equipment to the BSC or even corps if available.⁴⁸

The BSC is a multi-functional grouping of logistic assets located in the brigade rear area, and the FSMC also mainly located in the rear area, provides health services to the brigade. The BSC provides logistic support to the brigade rear area and reinforcing/backup support to the FSCs. The only exception is in medical support and CL VIII resupply. The BSC headquarters element is the administrative and command and control hub for all organic and attached elements; and coordinates area support within the BSA, and reinforcing/back up support to the FSC. The BSC S&T platoon: receives, stores, and issues CL II, III (P), IV and IX. The platoon receives and issues CL I, IV, V, and requires reinforcement from corps to provide water. The petroleum section maintains a half-day of operational requirements for the maneuver brigade, while the DSB supply company maintains the other half-day of supply. The maintenance platoon provides DS specific maintenance to the entire brigade on an area basis, and in a limited backup/reinforcing role to the FSCs. A forward repair platoon, organic to the BSC, provides an on-site area basis DS maintenance support service to division units not covered by the FSCs.

Moreover, in the BSC organization there is an engineer support platoon. This platoon has a multifunctional capability, designed to support an engineer battalion with all classes of supply, foodservice,

and organizational and DS maintenance.⁴⁹ The FSMC plays a key role in manning the force. The forward support medical company (FSMC) provides unit and division-level combat health support (CHS) to all units in the brigade's AO. The company is designed to perform nine major functions ranging from treatment of disease non-battle injuries to reinforcement of medical platoons and sections:⁵⁰

Did the new FSB design during the Army's array of tests, studies, and experiments sustain the flexibility and tactical mobility of the armored and mechanized infantry brigade?

This next part addresses the Army's analysis done to assess the viability of the FSB concept. The analysis results were documented in the Joint Venture Combat Service Support (CSS) Capstone Analysis, the Division Design Analysis (DDA), transportation mobility study, and Task Force XXI Army Warfighting Experiment (AWE).

Viability of the FSB Redesign

The Army's CSS planners over the past few years have conducted an array of field- tests, computer-assisted exercises, and constructive modeling exercises to determine the viability of the Division XXI CSS design concept.⁵¹ The Joint Venture Combat Service Support (CSS) Capstone Analysis, as of this time is in draft form, provides a comprehensive review of the analytic outcomes of the Army's JV analytic process. Critical issues concerning Division XXI CSS doctrine and force structure are identified in the report. Principal findings and results concluded that only some of the CSS concepts were tried and tested during the AWE's. Therefore, in the final analysis,

the CSS JV Capstone analysts suggested that full implementation of the CSS concept was not recommended until organizational structures were improved, tactics, techniques, and procedures were in place for all echelons, and additional analysis on the efficacy of the concept was conducted. There were also key insights drawn from the analytic process. These insights included: commanders must fight logistics like fire support; improves maneuverability of maneuver forces; anticipatory logistics is the principal concept for Force XXI CSS; situational awareness is required for successful Force XXI CSS, and CSS digitization is not optional.⁵² The U.S. Army Combined Arms Support Command (CASCOM) provided JV CSS Capstone analysts with an array of evaluation concepts. These served as the basic overarching framework for the summarization of analysis.

CASCOM developed the evaluation concepts to help guide the development of Force XXI CSS force structure. Evaluation concepts developed by CASCOM and used in the JV analysis were: high mobility, composite and multi-functional human technology, modular design, smallest possible footprint, fully digitized, centralized distribution management, integrated management activities, battlefield services echeloned at corps and above, and focus on replace forward versus repair.⁵³ Brief definitions for each of these evaluation concepts is provided below.⁵⁴

- High mobility is described as CSS forces being mobile to keep pace with and deliver support to maneuver forces on the extended, high-tempo battlefield.

- Composite and Multi-functional Human Technology is described as composite and multi-functional organizations at division and brigade level, and multi-functional soldiers consolidating services as maximizing the use of available soldiers.
- Modular in design is described as enabling the tailoring of CSS forces to support maneuver unit organization and mission support requirements.
- Smallest footprint is described as a CSS force with fewer people and less equipment thereby increasing the mobility of CSS and maneuver forces.
- Fully digitized is described as providing the foundation for situational awareness, which allows for successful information based operations.
- Centralized Distribution Management is described as supporting split-based logistics, and control of the array of CSS functions vertically and horizontally.
- Integrated management activities is described as assuring rapid throughput of supplies while minimizing forward stockage requirements.
- Battlefield service echeloned at corps and above is described as reducing the burden in forward areas while retaining total required support capacity.
- Focus on replace forward vs repair is described as increasing mobility by reducing maintenance forces in forward areas, and efficiently making use of maintenance resources.

In terms of those concepts directly effecting the conditions for flexibility and tactical mobility, four of the nine have been chosen for closer examination. Those four concepts are as follows: high mobility, modular design, smallest possible footprint, and full digitization. A review of some of the individual tests, studies, and experiments will also be conducted because the CSS JV Capstone Analysis provides only gross summation of the analytic results. These analysis provide a more definitive assessment of the CSS concept. Therefore, an examination of Phase III of the Division Design Analysis (DDA), and the TF XXI AWE are later examined.

First, however, a look at the summation of analytic data provided by the CSS JV Capstone analysis is a good start point. The analysis provides insight into the viability of Division XXI CSS concepts. It is paramount to note that the CSS JV Capstone findings are limited since complete testing of the design and its conceptual underpinnings were not fully tested.⁵⁵ Below the reader will find results of the assessment by capstone analysts, in those areas identified by the author as directly bearing on the central question of flexibility and tactical mobility, and these include: high mobility, multi-functional human technologies, modular design, smallest footprint, and full digitization.

- High Mobility: The concept was tested in all major exercises and test events at division level. Valid analysis could not be provided because the "total" transportation system including corps and theater assets were not tested. However, during the TF XXI AWE, analysis identified non-mission capable weapon systems awaiting

maintenance action and significantly reducing mobility of brigade level maintenance units as a result. And in a separate mobility study, it was determined that transport resources organic to the brigades were not sufficient to provide mobility for TOE, accompanied supplies, and small arms ammunition. In the area of combat health support, casualty evacuation means were often not available, and medical units experienced difficulty in staying mobile. It was also identified that essential to the mobility of maneuver brigades under the new concept is support from division and EAD. The problem is that scarce organic transport resources compete for two battlefield requirements, resupply and mobility.⁵⁶

Multi-Functional Human Technologies: Sufficient testing was done during the TF XXI (AWE) and DAWE to support a valid analysis. The FSB/FSC concept in this area was considered viable, but many outstanding questions remained. Doctrine and procedures for the organization and deployment of EAD resources were not studied. Test results gave the impression of CSS leaders being able to manage multi-functional commands; however, experience levels for FSC commanders may need to be increased. Span of control and responsibilities for the FSB, as result of organization design, functional requirements, and geographic span may be too overwhelming as well.⁵⁷.

Modular Design: The TF XXI (AWE) and DAWE was sufficient to support a valid analysis, and the prospect of increased modularity is viable, but testing showed a continued need to refine organization and doctrinal issues. Other problems identified were related to unclear command relationships, and lines of authority to employ modular

assets, along with the continuous change of modular relationships. A success story was the mobility tracking system, which facilitated control and visibility of forward deployed modular teams⁵⁸.

Smallest Footprint: Not enough analysis was done to produce anything other than a preliminary assessment. Found during the analysis was that a smaller divisional logistic footprint is fully dependent on an EAD presence to meet support requirements. The difficulty in this arena is EAD asset requirements in support of Division XXI patterns of operations have not been determined or validated. Concepts like the Theater Support Command have not been fully developed, maintenance manpower requirements are not defined, battlefield location of special diagnostic test equipment is unclear, and the implication of technological enablers is unclear. Another perplexing issue relates to the increased use of contractors on the battlefield. The Army is still wrestling with this subject, and is trying to formulate a doctrine to help guide implementation of the contractor component in future operations.⁵⁹

Full Digitization: CSS organizations could not be assessed. Not even a preliminary assessment was done due to a lack of insufficient data. Unfortunately, only a very limited number of digitized enablers were tested. The effects of technologies were "simulated" during computerized exercises, but sheer lack of prototype availability allowed for no field-testing to confirm utility or viability of new technologies and concepts. The lack of prototypes was a result of funding. Interestingly, however soldiers when given the option to choose, preferred analog equipment instead of new technologies. Also,

a second order consequence of the increased proliferation of digitized systems, resulted in the identification of a whole new system to keep new digitized systems functioning.⁶⁰ Now with an understanding of the CSS evaluation concepts and a brief summation of their efficacy, this next part examines four critical tactical logistic functions relative to sustaining flexibility and tactical mobility. Rather than choose all the tactical logistic functions, for the purposes of this monograph, only four were chosen.

The four functions chosen are fuel, arm, fix, and sustain (CHS), for these can directly effect the maneuver brigade's flexibility and tactical mobility. Without adequate fuel, ammunition, operational weapons systems, and healthy soldiers, a brigade's ability to adjust to changing conditions (flexibility) and move combat power over space and time (tactical mobility) is limited. An examination of the DDA phase III and TF XXI AWE provides an assessment of the CSS system to plan, prepare, and execute the latter tactical logistic functions.

The third phase DDA war-gamed the new approved TRADOC division designs: Conservative Heavy Division (CHD), Strike (STK), and Brigadier (BDT) within a context of three scenarios. These scenarios are: North East Asia (NEA), Lantica, and Southwest Asia (SWA).⁶¹ This monograph focuses on the analytic results of the approved design, the CHD, later termed Division XXI. Important for the reader to understand is that the CHD was war-gamed based on four assumptions. These assumptions were as follows: CSS enablers are in place, battle distribution and velocity management are mature concepts, EAD CSS units are at the highest authorized level of organization (ALO), and

future technologies work as planned.⁶² In addition to the assumptions, it is important to clearly understand the constraints and limitations shaping the results of the analysis. The constraints and limitations imposed on the war gaming were extensive, and included an array of issues. Some of these issues that could not adequately be defined in the context of the scenario required qualitative assessments. The CSS fidelity and resolution limited the "simulations" ability to stress the CSS system. And tasks to be executed based on the ability to employ technologies to support "anticipatory logistics" required "work-arounds."⁶³

Class III (Fuel): In the Lantica 3 scenario, the division experienced high levels of supply risk for follow-on missions, which effected the flexibility and tactical mobility of armored and mechanized infantry brigade task forces. Critical levels of fuel stockage were reached in the DSB before resupply from higher echelon support arrived. At least one unit's fuel balance on-hand fell below fifty percent, which triggered an emergency request. All emergency requests were "simulated" via aerial delivery. In a short scenario, the CHD placed thirty emergency supply requests with the number mainly contributed to the lengthening LOC. At one point, the CHD DSB, which pushes fuel to the FSCs, went zero balance before resupply took place. Armor and mechanized battalions did not experience stock levels below thirty percent, although the FSCs did experience short falls and many could not provide 100 percent of the fuel requested. Of the thirty emergency resupply requests generated, twenty-two occurred because supported battalions stock balances stayed between thirty and fifty

percent. In the NEA and SWA scenario fuel levels were not an impediment. The author contends that this was mainly because the CSS system was not fully stressed. Stock levels in those particular scenarios on aggregate remained above a fifty percent threshold.⁶⁴

Class V (Ammunition): The FSC concept adequately supported armor and mechanized infantry units. However, in transition to follow-on operations, one of the six patterns of operation, there was limited ability to resupply field artillery units. Because Force XXI operations rely heavily on deep fires, this lead to a high expenditure rate of artillery ammunition, which grossly exceeded Division XXI's CSS ability to be responsive to requirements. This lack of responsiveness effects directly the flexibility of the task force. Many instances also occurred where FA units went zero balance on one or more key munitions, and end state stockage levels for 155 mm were below fifty percent for FA units. FA units in total submitted 121 emergency requests for resupply. Although shipments were executed only around fifty percent were received before the scenario ended. In the NEA scenario, FA placed sixty percent of all emergency requests. The other forty-percent came from armor units short on 120mm munitions. In this scenario, armored and mechanized infantry units did not fall below the fifty-percent threshold. However, FSC's did experience reduced short-term stockage levels. In the SWA scenario, over fifty percent of all requests were via emergency resupply with FA dominating the requirements.⁶⁵

Critical stockage level shortfalls, mainly in FA ammunitions at the end of initial battles could effect the division from exploiting

success and conducting follow-on operations. In those scenarios offensively oriented there was reasonable feasible application of the CSS concept, provided the availability and use of CSS enablers, fully resourced corps support elements, and operations mirroring the duration of those war gamed. The operational imperatives of Division XXI operations, coupled with the operational environment, influenced time and distance factors, creating extended lines of communication and congestion along supply routes. This was made evident in the FA consumption rates, which did in fact strain CSS and pressured EAD throughput capabilities. The issue of supply route security and rear area protection also became an issue. LOCs in some scenarios extended 300 kilometers. The question of how and by whom LOC's will be secured, illustrates the potential grave impact of convoy losses in an already austere logistics environment with limited redundancy.⁶⁶ With reduced personnel end strength and reduced major weapon systems density, armored and mechanized infantry brigade commitment of combat power to LOC security, in environments similar to those modeled will become a tough choice for commanders to make. New patterns of division operations dictate requirements to resupply forward while fixing weapons systems in the rear. Critical imperatives for logistic units are the ability to conduct refuel on the move, throughput ammunition, and have sufficient means of recovery and evacuation. Lack of logistic redundancy is effected by unanticipated battle losses of CSS enabling technologies, impacting on fuel operations and exacerbating the already extremely difficult ammunition problems.⁶⁷ Stepping away from computer simulation, a review of the TF XXI AWE

conducted at the NTC provides an assessment of the viability of the new FSB design from a "muddy boots" field-test perspective.

The TF XXI AWE and CSS

TF XXI AWE was one of the key aspects of the JV campaign, with the EXFOR NTC rotation 97-06 being the capstone event. The warfighting experiment at the NTC equipped a brigade size experimental force (EXFOR) with advanced technologies to assess how it would do in terms of force capabilities, with an emphasis on battlefield command and control. Along a similar line of thinking, CSS planners tried their new organizational structures, and attempted to leverage the effects of digitized information-age technologies.⁶⁸ The CSS hypothesis for the experiment was as follows:

" If the brigade combat team (BCT) has the technological enablers (appilique, CSSCS, radio frequency tags, PLS enhanced (MTS), Wireless modem, PSSCS, Telemedicine, Teleconsultation, and MDA) and reorganizes IAW Division Redesign (FSCs for the AR and Mech Bns, BSC, and FSB HHC), then CSS can be synchronized with the maneuver forces and will be responsive and efficient in support of the BCT operations."⁶⁹

Before the EXFOR unit of the 4th Infantry Division (M) deployed, there were several train-up events for the exercise. The three major events were the platoon lanes, company lanes, and battalion task force lanes.⁷⁰ Even with all the preparation, a major problem with the TF XXI AWE was that it was geared to achieve a successful outcome. "The AWE was engineered for CSS success by design."⁷¹ During the AWE, the TF used during the experiment was a hybrid and not comparable to the Division XXI CSS structure designed by CASCOM.⁷² Due to a shortage of

available new technologies, the FSB of the EXFOR was allowed to augment its operation with additional soldiers. A detailed analysis of the military occupational mix for the FSB showed the largest percentage of personnel strength in the maintenance and supply specialties. In some areas the analysis showed that the FSB was over strength in maintenance areas critical to success.⁷³

Evidence shows the TF XXI AWE can not be considered a sound baseline for assessing the efficacy of the CSS component of Division XXI. The CSS hypothesis postulated by TRADOC could not be validated because many of the technologies were not available for testing. Also, the fact that the CSS organization tested was a hybrid, and not the original TRADOC design clouded the results of the analysis. In general, even the hybrid CSS organization tested during the AWE provided only "adequate" support to the EXFOR, with no supporting evidence to suggest CSS was improved over baseline AOE organizations. Important to note is the EXFOR was augmented with 450 contractors along with the added soldier augmentation package. However, some insights into the efficacy of the new design's ability to sustain the flexibility and tactical mobility of the armored and mechanized brigade were gleaned from the AWE.

One of the selling points of the new FSB concept was its supposed ability to free the maneuver commander from logistics, enabling him to focus on war fighting. Unfortunately, observations during the experiment indicated just the opposite effect. Commanders were still very involved in CSS planning and execution, and observers identified

maneuver commanders as wanting command and control of CSS because they did not have confidence in CSS units.⁷⁴

In the areas of fuel, arm, and fix, the concept is no where near achieving results as envisioned. The forecasting of fuel was done according to standard SOP, and technological information system's to facilitate refuel planning were not used. In arming, FSC's were limited due to a requirement for additional transportation assets to distribute ammunition. The ammunition transfer point (ATP), conceptually 100 percent mobile to keep pace with supported units was not. This simply demonstrated the lack of organic logistic transport, while also citing the shortage of 55B ammunition specialists and managers in the FSC and FSB. With the robust augmentation of civilians and soldiers in the maintenance arena, there was not much of a challenge to sustain tank and infantry fighting vehicles. Nearly 100 percent of all work was done in forward areas, and the merger of DS and organizational level of maintenance enhanced support. However, highlighted was the need for maintenance control officers and platoon leaders in the FSC/BSC.⁷⁵

In reference to the BSC, its critical role as a back up source of logistic support to the FSC's was impacted based on a lack of organic capability. Man-hours were observed as being spent on tasks which wasted time and responsiveness. The BSC with its lack of adequate distribution resources was spending its limited organic resources re-handling materiel supplied from higher echelons. And further observation identified the BSC as not 100 percent mobile, and

requiring more echelon above brigade asset support than standard baseline AOE NTC rotations.⁷⁶

CHAPTER IV

CONCLUSION

In summary, the nature of the future battlefield coupled with the six new patterns of operation, and the Army's requirement to reduce end-strength lead to a change in intellectual, organizational, and technological approach to logistics support. The imbedding of new imperatives to assure future success on the battlefield served as the driving force for development of organizations which are mission tailored, built to handle masses of information, and modular in design with a flexible leader to lead ratio. To achieve the former, the Army reduced CSS spaces by nearly ten-percent of AOE levels providing 4601 CSS spaces vice 5169 in the AOE, with a plan to integrate new technologies to ameliorate soldier reductions. As the evidence showed, this was not the first time "tail" was cut. LTG William Pagonis, in his book *Moving Mountains*, pointed out the fact "tough choices" had to be made in a period of tight budgets. The choices he referred to was between "teeth" and "tail", and "teeth" won.

The new Division XXI CSS organizational framework is radically altered. The elimination of the armored and mechanized infantry trains elements, the creation of the FSC's, and changing role of the MSB, termed DSB under the new design make for a sharp change. Essentially, the FSB's are now the sole providers of CSS in their respective brigade AO, and there is less robustness and redundancy in CSS

throughout the heavy division's AO. The Army's experiments, studies, and tests showed the challenges faced by the new organization framework. However, because of the limited conduct of the tests due to prototype availability and technical work-arounds and limitations/constraints with computer simulations, and a hybrid TF XXI CSS force, the analysis and conclusions do not portray the full scope of pros and cons associated with the Division XXI FSB. However, the author still concludes based on review of historical and current evidence associated with heavy division force development, that the Division XXI FSB as currently postulated does not sustain the flexibility and tactical mobility of the armored and mechanized infantry task force.

NOTES

¹ Martin Van Creveld, *Supplying War: Logistics from Wallenstein to Patton*, (Cambridge: Cambridge University Press, 1977) , 231-232

² Glen R. Hawkins and James J. Carafano, "Prelude to Army XXI: U.S. Army Division Design Initiatives and Experiments 1917-1995", (U.S. Army Center for Military History, 1997, accessed 24 September 1998); available from <http://call.army.mil/exfor/armyxxi/xxi.htm>; Internet

³ Ibid., 5.

⁴ LTC Billy J. Jordan, US Army and LTC Mark J. Reardon, US Army, "Restructuring the Division: An Operational and Organizational Approach", *Military Review* # 3 (May-June 98) : 22.

⁵ U.S. Army Training and Doctrine Command Analysis Center, "Combat Service Support (CSS) Enabler Functional Assessment (CEFA)", (Fort Lee, VA: TRADOC Analysis Center-Lee, 1998) , 3-42.

⁶ Honorable Dan Coates, "Division XXI: Landpower Transformation or Evolution", *National Security Studies Quarterly*, (Summer 1998) : 43.

⁷ Ibid.

⁸ Jim Caldwell, " New Design Framework for Army XXI Heavy Division", article released by TRADOC News Service, June 9, 1998

⁹ John Romjue, " The Army of Excellence: The Development of the 1980's Army", TRADOC Historical Monograph Series (Fort Monroe, VA: U.S. Army Training and Doctrine Command, 1982) : 26. Planners were emphasizing that any risks associated with cutting the divisions tail could be ameliorated by the integration of future technologies.

¹⁰ Romjue, 26.

¹¹ A.P. Dupay, "The Army of Excellence: At What Price to Combat Service Support", (Carlisle Barracks, PA: U.S. Army War College, 11 Apr 1988) : 18.

¹² Ibid., 20.

¹³ Romjue, 2.

¹⁴ Ibid., 93.

¹⁵ E.L. Andrews, "The Army of Excellence and the Division Support Command", (Carlisle Barracks, PA: U.S. Army War College, 21 May 1986) : 18.

¹⁶ U.S. Army Training and Doctrine Command (TRADOC) Analysis Center, "Combat Service Support (CSS) Enabler Functional Assessment (CEFA)", (Fort Lee, VA: TRADOC Analysis Center-Lee, 1998) : 3-42.

¹⁷ A.P. Dupay, "The Army of Excellence: At What Price to Combat Service Support, (Carlisle Barracks, PA: U.S. Army War College, 11 Apr 1988) : 23.

¹⁸ Romjue, 109.

¹⁹ CEFA, 4-9.

²⁰ GEN William Hartzog and LTC James G. Diehl, "Building the 21st Century Heavy Division," Military Review # 2 (March-April 1998) : 91.

²¹ United States Department of the Army, FM 100-5 Operations (Washington, D.C.: Government Printing Office, 1993) : 12-11. FM 100-5 defines tactical logistics in three realms: strategic, operational, and tactical. Over simplified, manning involves soldier replacement and casualty management; arming pertains to supplying weapons systems with ammunition; fueling entails supplying fuel to sustain weapon systems; fixing implies repairing weapons systems; moving involves the transportability of the force; and sustaining soldiers and their systems entails quality of life issues and health care matters.

²² United States Department of the Army, FM 100-10 Combat Service Support, (Washington, D.C.: Government Printing Office, 1995) : 1-4 to 1-5.

²³ United States Department of the Army, FM 71-2 Tank and Mechanized Infantry Battalion Task Force (Washington, D.C.: Government Printing Office, 1994) : 7-2.

²⁴ Ibid., 7-13.

²⁵ United States Department of the Army, FM 63-20 Forward Support Battalion, (Washington, D.C.: Government Printing Office, 1990) : 7-1 to 9-2.

²⁶ United States Department of the Army, Training and Doctrine Command Pamphlet 525-5 Force XXI Operations, (Fort Monroe, VA. : Training and Doctrine Command, 1994) : 3-1 to 3-2.

²⁷ Ibid., 4-5.

²⁸ MAJ Jon J. Peterson, US Army, "Changing How We Change", *Military Review* ,# 3 (May-June 1998) : 8.

²⁹ *Ibid.* , 5.

³⁰ Hartzog and Diehl, 93.

³¹ U.S. Army Training and Doctrine Command, *Force XXI: Land Combat in the 21st Century*, (Fort Monroe, VA: Training and Doctrine Command, undated) : 19-25.

³² Training and Doctrine Command Analysis Center, "Division XXI Advanced Warfighting Experiment: Capabilities and Potential (CAP) Team Assessment", (Fort Leavenworth, KS : TRADOC Analysis Center, 1998) : C II-8 to 9.

³³ United States Department of the Army, *TRADOC Pam 525-200-6: Combat Service Support* , (Fort Monroe, VA: Training and Doctrine Command, 1994) : 3.

³⁴ *Ibid.*

³⁵ *Ibid.*

³⁶ Douglas McGregor, *Breaking the Phalanx: A New Design for Land Combat in the 21st Century*, (Connecticut: Praeger Publishers, 1997) , 5.

³⁷ Robert M. Walker and LTG John G. Coburn, "The RML Intent," accessed July 1998 ; available from <http://www.lia.army.mil/rml.htm> ; Internet

³⁸ Kenneth Macksey, *For Want of a Nail: The Impact on War of Logistics and Communications*, (London: Brassey's , 1989) , 1.

³⁹ Tradoc Pam 525-5 , 3-20.

⁴⁰ Tradoc Pam 525-200-6 , 5.

⁴¹ CEFA, viii.

⁴² Romjue, 8.

⁴³ LTG William Pagonis w/ Jeffrey L. Cruikshank, *Moving Mountains: Lessons in leadership and Logistics from the Gulf War*, (Boston MA: Harvard Business School Press, 1992) , 202.

⁴⁴ "Force XXI CSS Concept for Combat Service Support," 15 May 1998, (Fort Lee, VA: Combined Arms Support Command) , 2-1.

⁴⁵ Ibid.

⁴⁶ Ibid., 2-3.

⁴⁷ Ibid., 2-10.

⁴⁸ Ibid., 2-11.

⁴⁹ Ibid., 2-12.

⁵⁰ Ibid., 2-13.

⁵¹ "Joint Venture Combat Service Support (CSS) Capstone Analysis," 17 April 1998, prepared for the Army by , Fort Lee, VA., Dynamics Research Corp and AEPSCO, Inc.

⁵² "Joint Venture Combat Service Support (CSS) Capstone Analysis," 17 April 1998, prepared for the Army by , Fort Lee, VA., Dynamics Research Corp and AEPSCO, Inc , v-vi.

⁵³ Ibid., 1-2 to 1-3.

⁵⁴ Ibid., 1-3 to 1-4.

⁵⁵ Ibid., 2-2.

⁵⁶ Ibid., 2-3 to 2-4.

⁵⁷ Ibid., 2-4.

⁵⁸ Ibid., 2-4 to 2-5.

⁵⁹ Ibid.

⁶⁰ Ibid.

⁶¹ "Force XXI Division Design Analysis Phase II/III: Division Combat Service Support Analysis Final Report," , Dec 97 (Fort Lee, VA: TRADOC Analysis Center-Fort Lee), 2-5.

⁶² Ibid., 2-6 to 2-7.

⁶³ Ibid.

⁶⁴ Ibid., 3-8 to 3-9. Input provided in the DDA Phase III Final Analysis Report

⁶⁵ Ibid., 3-10 to 3-11.

⁶⁶ "Division Design Analysis (DDA) Phases II and III Division Combat Service Support (CSS) Analysis Final Report, Executive Summary" , DEC 97 (Fort Lee, VA: TRADOC Analysis Center-Fort Lee) , Es-4 to Es -5

⁶⁷ Ibid.

⁶⁸ "Task Force XXI Advanced Warfighting Experiment (AWE) Combat Service Support (CSS) Analysis Report" , February 1998 (Fort Lee, VA: TRADOC Analysis Center-Fort Lee) , 1-1.

⁶⁹ Ibid., 1-3.

⁷⁰ Ibid., 3-7.

⁷¹ Ibid., 3-42.

⁷² Ibid., 3-5.

⁷³ Ibid., 3-6 to 3-7.

⁷⁴ Ibid., 3-19.

⁷⁵ Ibid.

⁷⁶ Ibid., 3-20.

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